

**REMARKS**

The Office Action contended that new issues were raised in the Rule 116 Amendment. Newly drafted Claims 35-38 are within the scope of the present invention, and it is requested that the remarks submitted with the Rule 116 Amendment be fully considered and acted upon.

If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 2, 2004.

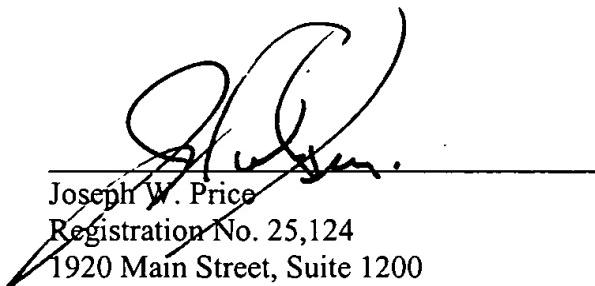
By: James Lee

Signature

Dated: July 2, 2004

Very truly yours,

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# COPY

Patent  
62478-6900

**RESPONSE UNDER 37 CFR SECTION 1.116  
EXPEDITED PROCEDURE - GROUP 2675**

Appl. No.:	09/805,529	Confirmation No.:	2114
Applicant:	Akira Shiokawa	Examiner:	Anyaso, Uchendu O.
Filed:	March 13, 2001	TC/A.U.:	2675
Title:	PANEL DISPLAY APPARATUS AND METHOD FOR DRIVING A GAS DISCHARGE PANEL	O.A. Date:	February 26, 2004
		Resp. Date:	May 25, 2004
Docket No.:	62478-6900		

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**AMENDMENT**

Technology Center 2600

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the FINAL Office Action of February 26, 2004 , please amend the above-identified application as follows:

**Amendments to the Specification** are not included herein.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Amendments to the Drawings** are not included herein.

**Remarks/Arguments** begin on page 12 of this paper.

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Previously Presented) A panel display apparatus for displaying an image in a discharge sustain period, comprising:  
a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and  
a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,  
wherein a pulse waveform of each sustain pulse is determined so that a particular current waveform is formed when the sustain pulse is applied, the particular current waveform being a waveform in which a time from when a peak is reached to when a fall is completed is no more than triple a time from when a rise is started to when the peak is reached.
2. (Currently Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:  
a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and  
a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately before a leading edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse[,] to the discharge cell for a predetermined period that is no more than 100 ns.

3. (Original) The panel display apparatus of Claim 2, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than an absolute value of a voltage of the sustain pulse.
4. (Cancelled)
5. (Original) The panel display apparatus of Claim 3, wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 50 ns.
6. (Original) The panel display apparatus of Claim 2, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than 1.5 times an absolute value of a voltage of the sustain pulse.
7. (Original) A panel display apparatus for displaying an image in a discharge sustain period, comprising:  
a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and  
a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,  
wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

8. (Original) The panel display apparatus of Claim 7, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than an absolute value of a voltage of the sustain pulse.
9. (Original) The panel display apparatus of Claim 8, wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 100 ns.
10. (Original) The panel display apparatus of Claim 8, wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 50 ns.
11. (Original) The panel display apparatus of Claim 7, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than 1.5 times an absolute value of a voltage of the sustain pulse.
12. (Currently Amended) A panel display apparatus comprising:  
a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and  
a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,  
wherein immediately before a leading edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns.

13. (Original) The panel display apparatus of Claim 12, wherein the driving circuit applies the pulse of the opposite polarity and the sustain pulse between the pair of first and second electrodes, by applying two rectangular pulses that are opposite in polarity, respectively to the first electrode and the second electrode.
14. (Currently Amended) A panel display apparatus comprising:
  - a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged
  - between a pair of substrates; and
  - a driving circuit which (a) accumulates a wall charge on the dielectric to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,
  - wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns.
15. (Previously Presented) A panel display apparatus for displaying an image in a discharge sustain period, comprising:
  - a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and
  - a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,
  - wherein an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period

being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

16. (Original) The panel display apparatus of Claim 15, wherein a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a discharge firing voltage of the discharge cell, and the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell.
17. (Original) The panel display apparatus of Claim 16, wherein a time during which the absolute value of the voltage of the sustain pulse exceeds the absolute value of the discharge firing voltage is no more than 100 ns.
18. (Currently Amended) The panel display apparatus of Claim 15, wherein immediately after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns.
19. (Original) A panel display apparatus comprising:  
a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates; and  
a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,  
wherein an absolute value of a voltage of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of

the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

20. (Original) The panel display apparatus of Claim 19, wherein a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a discharge firing voltage of the discharge cell, and the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell.
21. (Original) The panel display apparatus of Claim 20, wherein a time during which the absolute value of the voltage of the sustain pulse exceeds the absolute value of the discharge firing voltage is no more than 100 ns.
22. (Original) The panel display apparatus of Claim 19, wherein immediately after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.
23. (Currently Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:
  - a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and
  - a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,wherein immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns.

24. (Cancelled)

25. (Currently Amended) A panel display apparatus comprising:  
a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates; and  
a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,  
wherein immediately after a trailing edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns.

26. (Cancelled)

27. (Previously Presented) A panel display apparatus comprising:  
a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and  
a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,  
wherein when applying each sustain pulse between the pair of first and second electrodes, the driving circuit applies a first voltage between the pair of first and second electrodes for a fixed period from a leading edge of the sustain pulse, and applies a second voltage between the pair of first and second electrodes for a period from a lapse of the fixed period to a trailing edge of the sustain pulse, the second voltage having a smaller absolute value than the first voltage.

28. (Original) The panel display apparatus of Claim 27, wherein the driving circuit applies the first and second voltages between the pair of first and second electrodes, by applying two pulses that are same or opposite in polarity and overlap in time, respectively to the first electrode and the second electrode.
29. (Currently Amended) A panel display apparatus comprising:  
a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and  
a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity applies at least one sustain pulse between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,  
wherein immediately after a trailing edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns.
30. (Original) The panel display apparatus of Claim 29, wherein the driving circuit applies the sustain pulse and the pulse of the opposite polarity between the pair of first and second electrodes, by applying two pulses that are same in polarity and overlap in time, respectively to the first electrode and the second electrode.
31. (Currently Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:  
a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and

a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, immediately before a leading edge of each sustain pulse which is applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period that is not more than 100 ns.

32. (Original) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:
  - a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and
  - a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,wherein in the discharge sustaining step, immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period.
33. (Previously Presented) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:
  - a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and
  - a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

34. (Currently Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:
  - a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and
  - a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period that is not more than 100 ns.

**Remarks/Arguments:**

Claims 1-3, 5-23 and 25, 27-34 remain in this application. Claims 4, 24 and 26 were cancelled. Claims 2, 12, 14, 18, 23, 25, 29, 31 and 34 were amended herein.

The current Office Action rejects the pending claims as being unpatentable over *Nagai* (US6160349), *Miyazaki et al.* (US5909199, hereinafter *Miyazaki*), and/or *Nagai* in view of *Miyazaki*. The Applicant disagrees as the cited reference, whether taken individually or in combination, do not teach, suggest or motivate all of the recitations of any of the rejected claims as amended herein.

It should first be noted that it is improper to combine *Miyazaki* and *Nagai* in that each is directed to solving a problem not found in the other, and they utilize incompatible discharge methods. As such, there is no reason to combine them, and combining them would change the principal of operation of one or the other, and/or would also render one or the other unsuitable for its intended purpose. Despite the impropriety of combining them, the Office Action asserts that the references should be combined to reduce the duration of sustain pulses to suppress any undesirable discharge. However, *Nagai* would not benefit from reducing the duration of the sustain pulse, and in fact teaches against such a reduction in that it teaches the use of pulses of equal duration.

Even if combining them were proper, combination of the cited references does not make up for the inadequacies of the references taken individually. At least some of these inadequacies are specifically identified below.

Claim 1 recites in part: "wherein a pulse waveform of each sustain pulse is determined so that a particular current waveform is formed when the sustain pulse is applied, the particular current waveform being a waveform in which a time from when a peak is reached to when a fall is completed is no more than triple a time from when a rise is started to when the peak is reached." *Nagai*, however, is silent in regard to the current waveform produced. Although it does talk about voltage waveforms to be applied to electrodes, it is impossible to predict the resultant current waveforms. It should be noted that in the claimed invention the sustain pulses are applied to the discharge cells, and the current waveform is the waveform produced in each of the

discharge cells as a result of the applied voltage waveform. Although it may be possible to predict the current waveform resulting from a particular voltage waveform in a solid-state circuit, the discharge cells are not solid-state circuits. In the case of PDPs that produce gas discharge, even when the same voltage waveform is applied to differently constructed PDPs the resultant current waveforms vary greatly depending on panel construction. Therefore it is impossible to predict what current waveform will be generated if the voltage waveform shown in Figure 15 of *Nagai* is applied. As such, *Nagai* does not teach, suggest or motivate the recitations of claim 1, and this inadequacy is not overcome by using *Miyazaki* in place of or in combination with *Nagai*.

Claim 2, as amended herein, recites in part: "wherein immediately before a leading edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse to the discharge cell for a predetermined period that is no more than 100 ns". It should first be observed that the Office Action is silent in regard to how *Nagai* is supposed to satisfy the recitations of claim 2, but the rejection of claim 2 is lumped together with that of claim 1 which differs substantially from claim 2. As such, the Office Action provides no basis for the rejection of claim 2. Moreover, the cited references do not provide a proper basis for rejecting claim 2.

*Nagai* does utilize sustain pulses that alternate in polarity, but does not teach that adjacent pulses occur immediately before or after each other. As shown in figure 15, there is a substantially delay between pulses. Moreover, *Nagai* does not teach, suggest, or motivate the use of pulses having opposite polarities in addition to the sustain pulses. However, on the chance that the Office Action contemplates that adjacent sustain pulses satisfy the recitation of claim 2, and that the pulses shown in figure 15 of *Nagai* occur immediately before and after each other, claim 2 has been amended to more clearly distinguish the applied pulse that is opposite in polarity from a preceding sustain pulse by requiring that the pulse be applied for not more than 100 ns, a time period substantially shorter than the duration of each sustain pulse. As such, *Nagai* does not teach, suggest or motivate the recitations of claim 1, and this inadequacy is not overcome by using *Miyazaki* in place of or in combination with *Nagai*.

*Miyazaki* does not make up for the inadequacy of *Nagai* because it does not teach, suggest, or motivate the use of pulses having opposite polarities. Although the Office Action seems to assert

that figures 10A and 10B illustrate application of pulses opposite in polarity, the figures depict only changes in amplitude resulting from application of a constant current, not application of pulses opposite in polarity. Moreover, the Office Action implicitly acknowledges (in section 7 and by its citation of *Nagai*) that *Miyazaki* does not teach the use of pulses alternating in polarity.

Claim 3, 5 and 6 are at least patentable because of their dependence on claim 2. Moreover, the recitation in claim five shortening the duration, and the recitation in claim 6 regarding voltage difference further distinguish the claimed invention from the cited references.

Claim 7 recites in part: "successively applies a plurality of sustain pulses which alternate in polarity" and "wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period." As already discussed in regard to claim 2, *Miyazaki* does satisfy these recitations because it does not teach, suggest, or motivate the use of pulses having opposite polarities. Although the Office Action asserts that figures 10A and 10B illustrate application of pulses opposite in polarity, the figures depict only changes in amplitude resulting from application of a constant current, not application of pulses opposite in polarity. Moreover, the Office Action implicitly acknowledges (in section 7 and by its citation of *Nagai*) that *Miyazaki* does not teach the use of pulses alternating in polarity.

Claim 8, 9, 10 and 11 are at least patentable because of their dependence on claim 7. Moreover, the recitation in claims 9 and 10 specifying a short duration, and the recitation in claim 11 regarding voltage difference further distinguish the claimed invention from the cited references.

Claim 12, as amended herein, recites in part: "wherein immediately before a leading edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns." This recitation is sufficiently similar to that of claim 2 that the inadequacies of the cited reference in regard to claim 2 are equally applicable to claim 12. As such, claim 12 is patentable over the cited references. Claim 13 is patentable at least because of its dependence on claim 12.

Claim 14, as amended herein, recites in part: "wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns." This recitation is sufficiently similar to that of claim 2 that the inadequacies of the cited reference in regard to claim 2 are equally applicable to claim 14. As such, claim 14 is patentable over the cited references. Claim 15 is patentable at least because of its dependence on claim 14.

Claim 15 recites in part: " wherein an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse." This recitation is not addressed by the Office Action, presumably because *Nagai* teaches against such sustain pulses. In *Nagai*, sustain pulse voltages are maintained constant for the duration of the pulse, and are applied to maintain constant average voltage between electrodes. As such *Nagai* does not render claim 15 unpatentable, and the inadequacy of *Nagai* is not made up by *Miyazaki* as *Miyazaki* does not teach, suggest, or motivate sustain pulses having a higher initial voltage.

Claim 16 recites in part: " a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a discharge firing voltage of the discharge cell, and the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell." This recitation is not addressed by the Office Action, presumably because none of the cited references teach or suggest sustain pulses having a higher initial value let alone initial and subsequent values that are greater and lower than the discharge firing voltage of the discharge cell. As such, claim 16 is patentable over the cited references.

Claim 17 is patentable over the cited references at least because of its dependence on claim 16, but also because it limits the duration of the initial voltage of the pulse. As previously discussed the combination of the references is improper, and even if it were not, the combination described

in the Office Action would still not satisfy the recitations of claim 17 in regard to the having a different voltage at the start of the sustain pulse.

Claim 18, as amended herein, is patentable over the cited references at least because of its dependence on claim 15, but also because it recites "immediately after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns." As such, not only does the amplitude of the sustain pulse vary, but it is immediately followed by a short pulse opposite in polarity. This recitation is not addressed by the Office Action, and is not taught, suggested, or motivated by any of the cited references.

Claim 19 recites in part: "wherein an absolute value of a voltage of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse." This recitation is sufficiently similar to that of claim 15 that the inadequacies of the cited references in regard to claim 15 are equally applicable to claim 19. As such, claim 19 is patentable over the cited references.

Claim 20 recites in part: "wherein a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a discharge firing voltage of the discharge cell, and the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell." As with claim 16, claim 20 is patentable over the cited references both because of its dependence on claim 19, and the failure of the cited references to address the recitations added by claim 20.

As with claims 17 and 18, claims 21 and 22 (because they contain similar recitations) are patentable both because they are dependent on patentable claims, and because they each add recitations not taught, suggested, or motivated by the cited references.

Claim 23 recites in part: "wherein immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns."

The Office Action is silent in regard to how the cited references teach, suggest, or motivate application of a pulse having an opposite polarity immediately after a trailing edge of each sustain pulse. To the extent that the basis for rejecting claim 12 is applied to rejection of claim 23, the cited references are inadequate for the reasons provided in regard to claims 2 and 12.

The recitations of claim 25 are sufficiently similar to those of claims 23 and 14 that the inadequacies of the cited references identified in regard to those claims are equally applicable. As such, claim 25 is patentable over the cited references.

Claim 27 recites in part: "wherein when applying each sustain pulse between the pair of first and second electrodes, the driving circuit applies a first voltage between the pair of first and second electrodes for a fixed period from a leading edge of the sustain pulse, and applies a second voltage between the pair of first and second electrodes for a period from a lapse of the fixed period to a trailing edge of the sustain pulse, the second voltage having a smaller absolute value than the first voltage." As with claims 15 and 19, the cited references fail to teach, suggest, or motivate a sustain pulse having a higher initial voltage than the remainder of the pulse. As such, claim 27 is patentable over the cited references.

Claim 28 recites in part: "the driving circuit applies the first and second voltages between the pair of first and second electrodes, by applying two pulses that are same or opposite in polarity and overlap in time, respectively to the first electrode and the second electrode." The cited references do not teach, suggest, or motivate the use of voltage pulses overlapping in time to obtain a sustain pulse having a higher initial voltage. As such, claim 28 is patentable over the cited references.

Claim 29 recites in part: "wherein immediately after a trailing edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns." This recitation is sufficiently similar to that of claims 2 and 12 that the inadequacies of the cited reference in regard to claims 2 and 12 are equally applicable to claim 29. As such, claim 29 is patentable over the cited references. Claim 13 is patentable at least because of its dependence on claim 12.

Claim 30 recites in part: "the sustain pulse and the pulse of the opposite polarity between the pair of first and second electrodes, by applying two pulses that are same in polarity and overlap in time, respectively to the first electrode and the second electrode". As such, claim 30 is patentable over the cited references both because of its dependence on claim 29, and, as with claim 28, because the cited references do not teach, suggest, or motivate the use of voltage pulses overlapping in time to obtain a sustain pulse having a higher initial voltage.

Claim 31, as with claims 2, 33, and 34, contains recitations not addressed by the Office Action. The recitations of claim 2 are sufficiently similar to those of claim 30 that the inadequacies of the cited references in regard to those recitations are equally applicable to those of claim 30. As such, claim 30 is patentable over the cited references.

The recitations of claim 32 are sufficiently similar to those of claim 7 that the inadequacies of the cited references in regard to claim 7 are equally applicable to claim 32. As such, claim 32 is patentable over the cited references.

In regard to claim 33, it should be observed that the Office Action is silent in regard to how *Nagai* is supposed to satisfy the recitations of claim 33 but the rejection of claim 33 is lumped together with that of claim 1 which differs substantially from claim 33. As such, the Office Action provides no basis for the rejection of claim 33. Moreover, the cited references do not provide a proper basis for rejecting claim 33. The recitations of claim 33 are sufficiently similar to those of claim 15 that the inadequacies of the cited references in regard to claim 15 are equally applicable to claim 33. As such, claim 33 is patentable over the cited references.

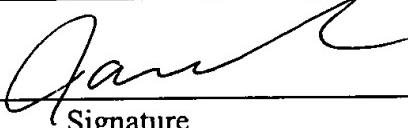
In regard to claim 34, it should be observed that the Office Action is silent in regard to how *Nagai* is supposed to satisfy the recitations of claim 34 but the rejection of claim 34 is lumped together with that of claim 1 which differs substantially from claim 34. As such, the Office Action provides no basis for the rejection of claim 34. Moreover, the cited references do not provide a proper basis for rejecting claim 34. The recitations of claim 34 are sufficiently similar to those of claim 23 that the inadequacies of the cited references in regard to claim 23 are equally applicable to claim 33. As such, claim 33 is patentable over the cited references.

Applicant requests that future Office Actions take note of the fact that the waveforms depicted in *Miyazaki* that appear most similar to those claimed are current waveforms and not voltage waveforms, and the corresponding voltage waveforms are quite dissimilar. It should also be noted that although the waveforms stretch across a central axis, what is depicted are oscilloscopes and there is no indication that the axis represents a null voltage or current value.

It is believed that the case is now in condition for allowance, and an early notification of the same is requested. If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 25, 2004.

By: James Lee

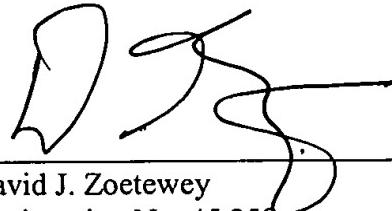


Signature

Dated: May 25, 2004

Very truly yours,

**SNELL & WILMER L.L.P.**



David J. Zoetewey  
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Received in the U.S. Patent Office  
Kindly date-stamp and return this card with  
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Date: *May 25, 2004* Serial No.: *09/805,529*  
Client: *Nakajima*  
For: *Panel Display Apparatus...*  
Dkt. No.: *62478-6900 (B02)*

Enclosed are:

- |  |  |
|--|--|
| <input type="checkbox"/> Specification and Claims (PP- ) | <input type="checkbox"/> Declaration, Power of Attorney    |
| <input type="checkbox"/> Drawings ( _____ sheets)        | <input type="checkbox"/> Assignment                        |
| _____ Formal _____ Informal                              | <input checked="" type="checkbox"/> Amendment              |
| <input type="checkbox"/> Info. Disc. Statement           | <input checked="" type="checkbox"/> Certificate of Mailing |
| <input type="checkbox"/> Dep. Acct. _____ for _____      | <input type="checkbox"/> Issue Fee Transmittal             |
| <input type="checkbox"/> Priority Documents              | <input checked="" type="checkbox"/> Transmittal Letter     |
| <input type="checkbox"/> PTO 1449 W/References           | <input type="checkbox"/> Extension of Time                 |
| <input type="checkbox"/> Other                           | <input type="checkbox"/> Express Mail No.                  |

## AMENDMENT TRANSMITTAL LETTER (Large Entity)

Docket No.

62478-6900

Applicant(s): Akira Shiokawa

Serial No.  
09/805,529Filing Date  
March 13, 2001Examiner  
Anyaso, Uchendu O.Group Art Unit  
2675

Invention: PANEL DISPLAY APPARATUS AND METHOD FOR DRIVING A GAS DISCHARGE PANEL



TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith is an amendment in the above-identified application.

The fee has been calculated and is transmitted as shown below.

## CLAIMS AS AMENDED

	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	31 -	34 =	0	x \$18.00	\$0.00
INDEP. CLAIMS	15 -	15 =	0	x \$86.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$0.00

- No additional fee is required for amendment.
- Please charge Deposit Account No. in the amount of
- A check in the amount of to cover the filing fee is enclosed.
- The Director is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 19-2814
  - Any additional filing fees required under 37 C.F.R. 1.16.
  - Any patent application processing fees under 37 CFR 1.17.

Signature

Dated: May 25, 2004

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I certify that this document and fee is being deposited on May 25, 2004 with the U.S. Postal Service as first class mail under 37C.F.R. 1.8 and is addressed to the for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature of Person Mailing Correspondence

James Lee

Typed or Printed Name of Person Mailing Correspondence

CC: